

REMARKS

The Examiner's comments together with the cited references have been carefully studied. Claims 1-25 stand rejected. Claims 1 and 2 have been amended. Claim 4 has been cancelled. Claims 1-3 and 5-25 are presently pending. Favorable reconsideration in view of the foregoing amendments and following remarks is respectfully requested.

The basis for the amendment to claim 1 providing a concentration from 1.4×10^{-2} to 0.3 mol/l can be found on page 8, line 1 of the specification and claim 4 as originally filed. The basis for amendment to claim 1 providing a temperature from 15°C to 35°C can be found on page 7, line 22 of the specification.

Rejection under 35 U.S.C. § 112, First Paragraph:

The Examiner has rejected claims 1-25 under 35 U.S.C. 112, first paragraph, indicating that the specification does not reasonably enable aluminum concentrations less than 0.3 mol/l. Applicants have amended the claim to recite an aluminum concentration from 1.5×10^{-2} to 0.3 mol/l, which is enabled by the specification. This amendment is deemed to obviate this rejection and therefore it is requested that this rejection be withdrawn.

Rejection under 35 U.S.C. § 112, Second Paragraph:

The Examiner has rejected claims 1-25 under 35 U.S.C. 112, second paragraph, indicating that the term "obtainable" renders the claim indefinite. Applicant has amended claim 1 to recite a polymer "obtained by" the claimed preparation process. The Examiner has further indicated that the term "ambient" is not defined. Application has amended the claims to define a suitable temperature range. The Examiner also indicates that claim 2 is unclear. Applicants have amended this claim to remove the indefiniteness or ambiguity. Therefore, it is respectfully requested that this rejection be withdrawn.

Rejection under 35 U.S.C. § 103(a) over Liu in view of Poncelet:

The Examiner has rejected claims 1-25 under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US 6,548,149) in view of Poncelet et al. (US

5,916,946). Applicants respectfully submit that the references do not disclose, teach, or suggest an aluminosilicate polymer obtained by the preparation method claimed. Therefore, it is respectfully requested that this rejection be reconsidered and withdrawn.

According to the Examiner:

Liu teaches an ink jet recording element comprising a support and an ink jet receiving layer, and the ink jet receiving layer contains a polyvinyl alcohol binder and an aluminosilicate polymer....Liu also teaches that the aluminosilicate used in the ink jet receiving layer has an Al/si molar ratio of 1:4..., and that the use of the aluminosilicate results in the ink jet receiving layer having an enhanced gloss, an enhanced weathering resistance, and that the layer produces images having enhanced quality. However, Liu's teachings merely recite a general teaching that aluminosilicate can be used in the ink jet receiving layer to achieve these results. Poncelet, drawn to an organic /inorganic composite and photographic product containing such a composite, teaches a hybrid, organic/inorganic composite aluminosilicate polymer having an Al/Si molar ratio between 1 and 3, and an Al concentration between 5×10^{-4} and 5×10^{-2} mol/l....Poncelet also teaches that the organic/inorganic composite aluminosilicate polymer can be used in image-receiving layers and products having these layers applied thereon, and that such layers exhibit enhanced performance characteristics....As both Liu and Poncelet are drawn to the same field of invention, it would have been obvious to a person having ordinary skill in the art at the time of invention to have made the ink jet recording material taught by Liu and to incorporate the composite polymer taught by Poncelet.

The Examiner indicates that the claims are viewed as product-by-process claims. However, the aluminosilicate materials obtained by the references are obtained by a different process than that of the claimed invention. Those skilled in the art of aluminosilicate chemistry understand that the nature of the product is dependent upon the method of production. Small changes in the method yield distinct products.

Claim 1 of the instant invention requires treating a mixture of aluminum and silicon alkoxide with aqueous alkali in the presence of silanol groups with an aqueous alkali, the aluminum concentration, Al/Si molar ratio and alkali/Al molar ratio being maintained at specified concentrations; stirring the mixture at a

temperature between 15°C and 35°C long enough to form an aluminosilicate polymer; and eliminating the by-products.

The references fail to disclose all of the claimed limitations.

Applicants note that the Examiner has acknowledged that Liu et al. merely recites a general teaching that aluminosilicates can be used in inkjet receiver layers to achieve certain properties. While Poncelet et al. teaches an organic/inorganic composite aluminosilicate polymer for use in image receiving layers, the reference fails to disclose an inkjet receiving layer. Furthermore, Poncelet et al. is non-analogous art as the reference fails to disclose an ink-recording element having improved image quality or stability.

In the field of aluminosilicate chemistry, those skilled in the art understand that the nature of the product is extremely dependent upon the method of production. A product made by a distinct process would have a different structure, and therefore, the different properties. Therefore, one skilled in the art would not expect to obtain a material yielding the same properties when the material is obtained from a distinct process.

For example, a synthesis carried out in water, such as in Comparative Example 1, yields type I allophane with a hollow spherical shape with the silanol sheet inside and the aluminol sheet outside. However, a syntheses carried out in an organic solvent leads to a type II allophane having a hollow spherical shape with the silanol sheet outside and the aluminol sheet inside. See Hollow Nanospheres, Allophanes, "All-organic synthesis and characterization, Linder et al. Microporous Mesoporous materials (1998) 21(4-6), 381-386.

In Comparative Example 5 of the specification, the aluminosilicate is prepared in the absence of alkali, and is heated to 80°C, which is above the claimed temperature range. By contrast, Inventive Example 7 is prepared having an alkali/Al ratio of 2.31 and is prepared within the claimed 15°C to 35°C temperature range. As demonstrated by comparing Fig 5. (correlating to Comparative Example 5) with Fig. 7 (correlating to Inventive Example 7), the dye keeping ability of the product obtained by having an alkali/Al ratio of 2.31 is superior. Furthermore, as indicated by Table II, the gloss of Inventive Example 7 is much higher than that of comparative Example 5.

The aluminosilicate disclosed by Poncelet et al. is prepared by a method “as disclosed in WO96/13459” which is analogous to the method disclosed in U.S. Pat. No. 6,408,492. This method contains many distinct elements from the claimed invention.

First, according to the method disclosed by Poncelet et al., aluminium and silicon alkoxide are mixed with aqueous alkali and then the mixture is heated to about 95°C for several hours. By contrast, the method disclosed by the claimed invention does not include a heating step. Instead, the mixture is maintained at a temperature from 15°C to 35°C.

Second, the aluminosilicate formed by the method disclosed by Poncelet et al. is an “imogolite,” namely a filamentous, tubular, crystalline form of an aluminosilicate. The reference further discloses the *fibrous* nature of this product. By contrast, the aluminosilicate of the instant invention has an *amorphous* structure, as confirmed by Raman spectra.

Third, according to Poncelet et al. the first step of treating the mixed aluminium and silicon alkoxide with alkali is also carried out in the presence of a water-soluble organic polymer leading to an organic/inorganic composite. Such a composite is distinct from the hybrid aluminosilicate polymer of the instant invention, wherein the organic part is not polymeric and is covalently linked to the aluminosilicate polymer through the non-hydrolyzable substituent borne by the silicon alkoxide precursor. In Poncelet et al. the organic part, which is polymeric, is not part of the aluminosilicate polymer. Instead, the organic part is added to the reaction mixture to create a matrix and hence the “composite.”

Regarding Liu et al., the reference discloses an ink jet recording element comprising a support and at least one ink-receiving layer comprising a hydrosoluble binder and an aluminosilicate polymer. However the aluminosilicate polymer is not obtained by the method disclosed by the instant claims. As mentioned above, the nature of an aluminosilicate polymer is extremely dependent on its method of production.

The aluminosilicate material obtained by the method disclosed by Liu et al., is also by a different process from that of the presently claimed invention. Liu et al. utilizes an acid catalyst. By contrast, the instant invention utilizes an alkali and

alcohol as the reaction solvent instead of water such that no silanol groups are present. Liu et al. fails to disclose utilizing an alkali and silanol as a reaction component as claimed. Therefore, the method disclosed by Liu et al. is not capable of maintaining an alkali/Al molar ratio of between 2.3 and 3 as indicated by the present claims.

Moreover, Liu et al. fails to disclose stirring the mixture at a temperature of from 15°C to 35°C in the presence of silanol groups long enough to form an aluminosilicate polymer. As indicated in col. 23, lines 1-12 of Liu et al., the mixture is heated to a temperature of 60°C for 24 hours. This is well above the range recited by the instant claims.

In addition to failing to teach all of the claimed limitations, the cited references comprise non-analogous art. Poncelet et al. relates to solving the problem of surfaces of plastic, photographic films being charged with static electricity, see col. 1 lines 12-14. The inorganic/organic composite disclosed by the reference has antistatic properties, making it particularly suitable for photographic products where dust and contaminants are likely to be deposited. By contrast, the instant invention relates to solving the problem of providing an inkjet recording element, which is required to have good dye-keeping stability. Therefore, one skilled in the art would not have considered the use of the organic/inorganic composite of Poncelet et al.

Regarding the indication that claims 1-22 are viewed as product-by-process claims, the aluminosilicate materials obtained by Liu et al. and Poncelet et al. are obtained by a different process than that of the claimed invention. As discussed above, in the field of aluminosilicate chemistry, those skilled in the art understand that the nature of the product is extremely dependent upon the method of production. A product made by a distinct process would have a different structure, and therefore, the different properties. Therefore, one skilled in the art would not expect to obtain a material yielding the same properties when the material is obtained from a distinct process utilizing the method disclosed by references. The products obtained by the two distinct processes are not the same. As the two products demonstrate distinct properties, it is respectfully urged that the products disclosed by Liu et al. and Poncelet et al., which is obtained by a distinct process, is different from the product

obtained by the presently claimed invention. Therefore, the references do not provide a proper basis for rejection of the instant claims.

Claims 2, 3 and 5-25 benefit from dependency on claim 1, which as discussed above, is patentable. In view thereof, it follows that the subject matter of the claims would not have been obvious of Liu et al. in view of Poncelet et al. at the time the invention was made.

Double Patenting:

Applicants note that claims 1-19 are provisionally rejected over copending Application Nos. 2005/0238559, 2006/0165921, 2007/0054069, and 2008/0097063. These rejections are deemed overcome by the enclosed Terminal Disclaimer.

Applicants have reviewed the prior art made of record and believe that singly or in any suitable combination, they do not render Applicants' claimed invention unpatentable.

In view of the foregoing remarks and amendment, the claims 1-3 and 5-25 are now deemed allowable and such favorable action is courteously solicited.

Should the Examiner consider that additional amendments are necessary to place the application in condition for allowance, the favor is requested of a telephone call to the undersigned counsel for the purpose of discussing such amendments.

Respectfully submitted,



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Enclosure: Terminal Disclaimer

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

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